

**Adiabatic Scanning Calorimetry of Phase Transitions
in a Chiral Liquid Crystal With Blue Phases and
Twist-Grain-Boundary Phases**

M. Young, G. Pitsi, and J. Thoen
*Laboratorium voor Akoestiek en Thermische Fysica
Katholieke Universiteit Leuven
Celestijnenlaan 200D
B - 3001 Leuven, Belgium*

Chirality plays an important role in phase behavior in liquid crystals. In addition to generating chiral variations of the nematic and the tilted smectic phases, chirality may result in completely new blue phases (BPs) and twist-grain-boundary smectic A and smectic C phases (TGBA and TGBC). Phase transitions in these types of liquid crystals have direct analogies with those in type II superconductors. Hence, their study is of general interest. The phase transitions can either be second-order or weakly first-order often with strong fluctuation effects.

High-resolution adiabatic scanning calorimetry (ASC) is very suitable for distinguishing between (weakly) first-order and second-order phase transitions as well as for determining the pretransitional specific capacity behavior [1]. In this paper we will present new ASC results for a short pitch chiral compound (1-methylheptyl-3'-fluoro-4'-(3"-fluoro-4"-octadecyloxybenzoyloxy) tolan-4-carboxylate) with a novel phase sequence $C_r-S_{C^*}$ -TGBA-BPs-I [2]. Phase transition and pretransitional critical behavior will be compared with theoretical expectations.

- [1] J. Thoen, *Int. J. Mod. Phys.* **B9**, 2157 (1995).
- [2] M.-H. Li, H.-T. Nguyen, and G. Sigaud, *Liq. Cryst.* **20**, 361 (1996).